U.S. Department of Justice

Drug Enforcement Administration

Schedules of Controlled Substances: Placement of *N*-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(cyclohexylmethyl)-1*H*-indazole-3-carboxamide (MAB-CHMINACA; ADB-CHMINACA) into Schedule 1

Background, Data, and Analysis:
Eight Factors Determinative of Control and Findings Pursuant to 21 U.S.C. 812(b)

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I. Background

On February 5, 2016, the Acting Administrator of the Drug Enforcement Administration (DEA) published a Final Order in the Federal Register (81 FR 6171) temporarily placing *N*-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(cyclohexylmethyl)-1*H*-indazole-3-carboxamide (other names: MAB-CHMINACA; ADB-CHMINACA), a synthetic cannabinoid (SC) substance in schedule I of the Controlled Substances Act (CSA) upon finding that this substance posed an imminent threat to the public safety. Synthetic cannabinoids (SCs) are substances synthesized in laboratories that mimic the biological effects of delta-9-tetrahydrocannabinol (THC), the main psychoactive ingredient in marijuana. That Final Order, which became effective on the date of publication, was based on findings by the Acting Administrator of the DEA that the temporary scheduling of MAB-CHMINACA was necessary to avoid an imminent hazard to the public safety pursuant to 21 U.S.C. 811(h)(1). MAB-CHMINACA has not been investigated for medical use nor is it intended for human use. With no known legitimate use and safety information, manufacturers are surreptitiously adulterating plant material with MAB-CHMINACA and distributors are selling the associated products which pose potentially dangerous consequences to the consumer. Data from law enforcement, health care practitioners, and scientific and medical literature indicate that these products are being abused for their psychoactive properties. There have been extensive reports of admissions to hospital emergency departments (ED) and deaths following abuse of MAB-CHMINACA.

Detailed chemical analyses by the DEA and other agencies have found SCs, including MAB-CHMINACA, applied on plant material in herbal incense products marketed to the general public. Product analyses have found variations in both the type of synthetic cannabinoid and the amount of the substance found on the plant material.

It is believed SCs were first introduced on the designer drug market in several European countries as "herbal incense" before the initial encounter in the United States by U.S. Customs and Border Protection (CBP) in November 2008. Following reports of numerous adverse health-related incidents, some European countries banned these

products/chemicals. From 2009 to the present, abuse of SCs has increased in the United States with law enforcement encounters describing SCs laced on green plant material and in other designer drug products intended for human consumption. It has been demonstrated that the substances and the associated designer drug products are abused for their psychoactive properties. MAB-CHMINACA is one of the latest of the many generations of SCs having been encountered since 2009. The abuse of this substance is negatively impacting communities.

Adverse health consequences may also occur from directly ingesting the drug during the manufacturing process. MAB-CHMINACA, similar to other SCs, has been shown to be laced on green plant material and packaged in both colorful packaging and non-descript plastic baggies for dissemination.

The designer drug products laced with SCs, including MAB-CHMINACA, are often sold under the guise of "herbal incense" or "potpourri," and are routinely labeled "not for human consumption." Additionally, these products are marketed as a "legal high" or "legal alternative to marijuana" and are readily available over the Internet, in head shops, or sold in convenience stores under various product names. There is an incorrect assumption that these products are safe (Fattore and Fratta, 2011; McGuinness and Newell, 2012), that they are a synthetic form of marijuana, and that labeling these products as "not for human consumption" is a legal defense to criminal prosecution.

MAB-CHMINACA emerged on the illicit drug market in 2014. MAB-CHMINACA has also been shown to cause severe toxicity and adverse health effects following ingestion, including: seizures, excited delirium, cardiotoxicity, and death (Trecki et al., 2015; CDC, 2015; Hasegawa et al., 2015). Section 1152 of the Food and Drug Administration Safety and Innovation Act (FDASIA) amended the CSA by placing cannabimimetic agents and 26 specific substances (including 15 SCs, 2 synthetic cathinones, and 9 phenethylamines of the 2C-series) in schedule I. MAB-CHMINACA was not included among the 15 SCs that are specifically named under FDASIA, and do not fall under the legal definition of cannabimimetic agents as provided under FDASIA.

To protect the public health and safety, the DEA temporarily placed MAB-CHMINACA in schedule I of the CSA on February 5, 2016. In accordance with the provisions of 21 U.S.C. § 811(b) of the CSA, the DEA has gathered the necessary data, including scientific, public health, and law enforcement information on MAB-CHMINACA, as well as its associated products. This information was submitted to HHS on May 18, 2016, along with a request for a scientific and medical evaluation and a scheduling recommendation, for this substance. On January 19, 2018, The Food and Drug Administration (FDA) sent the DEA their "Basis for the Recommendation to Place *N*-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(cyclohexylmethyl)-1*H*-indazole-3-carboxamide (MAB-CHMINACA; ADB-CHMINACA),and its salts, in Schedule I of the Controlled Substances Act".

II. Eight Factors Determinative of Control

In accordance with the provisions of 21 U.S.C. 811(b) of the Controlled Substances Act (CSA), the DEA has gathered the necessary data, including scientific, public health, and law enforcement information on MAB-CHMINACA, as well as its associated products. The DEA collected data in light of the information to be considered under 21 U.S.C. 811(c). On May 18, 2016, the DEA requested from the Assistant Secretary of Health for HHS a scientific and medical evaluation and scheduling recommendation for MAB-CHMINACA pursuant to 21 U.S.C. 811(b). Administrative responsibilities for evaluating a substance for control under the CSA are performed for the HHS by the FDA, with the concurrence of the National Institute on Drug Abuse (NIDA) ((Memorandum of Understanding, 50 FR 9518–20) (Mar. 8, 1985)). Upon receipt and evaluation of the scientific and medical evaluation and scheduling recommendation from the Assistant Secretary on January 19, 2018, the DEA reviewed these documents and all other relevant data and conducted its own eight-factor analysis on MAB-CHMINACA pursuant to 21 U.S.C. 811(c). The DEA's eight-factor review as presented below finds that MAB-CHMINACA, and its salts, isomers, and salts of isomers warrant continued control in schedule I of the CSA.

Factor 1: The Actual or Relative Potential for Abuse

The first factor the DEA must consider is the actual or relative potential for abuse of MAB-CHMINACA. In addition to the information the HHS provided in its scientific and medical evaluation document for MAB-CHMINACA (HHS review, 2018), the DEA considers all other relevant data regarding its actual or relative potential for abuse. The term "abuse" is not defined in the CSA. However, the legislative history of the CSA suggests that the DEA consider the following criteria in determining whether a particular drug or substance has a potential for abuse[1]:

a) *There is evidence that individuals are taking the drug or drugs containing such a substance in amounts sufficient to create a hazard to their health or to the safety of other individuals or of the community; or*

b) *There is significant diversion of the drug or drugs containing such a substance from legitimate drug channels; or*

c) *Individuals are taking the drug or drugs containing such a substance on their own initiative rather than on the basis of medical advice from a practitioner licensed by law to administer such drugs in the course of his professional practice; or*

d) *The drug or drugs containing such a substance are new drugs so related in their action to a drug or drugs already listed as having a potential for abuse to make it likely that the drug will have the same potentiality for abuse as such drugs, thus making it reasonable to assume that there may be significant diversions from legitimate channels, significant use contrary to or without medical advice, or that it has a substantial capability of creating hazards to the health of the user or to the safety of the community*.

Of course, evidence of actual abuse of a substance is indicative that a drug has a potential for abuse.

a. *There is evidence that individuals are taking the drug or drugs containing such a substance in amounts sufficient to create a hazard to their health or to the safety of other individuals or to the community.*

[1] Comprehensive Drug Abuse Prevention and Control Act of 1970, H.R. Rep. No. 91-1444, 91st Cong., Sess. 1 (1970); reprinted in 1970 U.S.C.C.A.N. 4566, 4603.

Review of scientific and medical literature indicates that the ingestion of SCs leads to adverse health effects. Specifically, adverse effects following ingestion of MAB-CHMINACA have included: tachycardia, aggressive or violent behavior, confusion, depressed mental status, severe agitation, psychosis and/or death (CDC, 2015; Trecki et al., 2015. Hasegawa et al., 2015, Katz et al., 2016).

The HHS noted that the American Association of Poison Control Centers[2] (AAPCC) reported 7,779 exposures to SCs from January 1 to December 31, 2015. The significance of this value is based upon reporting of human exposures to SCs since 2011. While 2012 – 2014 saw a reduction in exposure calls to AAPCC, 2015 records demonstrate resurgence in calls to poison centers regarding SCs. In addition, the largest monthly tally of calls to poison centers ever recorded by AAPCC in reference to SCs occurred in April 2015, with 1,512 calls. Overdose data demonstrated that the largest outbreak from synthetic cannabinoids occurred from March – May, 2015, with MAB-CHMINACA as the primary substance confirmed (Trecki et al., 2015; CDC, 2015) by forensic toxicological analysis.

b. There is significant diversion of the drug or substance from legitimate drug channels

In a letter to DEA dated June 3, 2015, the HHS stated that there are no approved new drug applications or investigation new drug applications for MAB-CHMINACA. In their scheduling recommendation, HHS stated that there are no approved new drug applications for MAB-CHMINACA in the United States, and there is no known medical

[2] The American Association of Poison Control Centers collects information logged by the numerous regional Poison Control Centers (PCCs). Records are from self-reported calls; therefore, they reflect only information provided when the public or healthcare professional reports an actual or potential exposure to a substance (e.g. an ingestion, inhalation, or topical exposure), or requests informational material. It warrants noting that these exposures do not inherently represent an instance of poisoning or overdose. The AAPCC is not able to completely verify the accuracy of every report made to member centers. Additional exposures may go unreported to PCCs and data referenced from the AAPCC should not be construed to represent the complete incidence of national exposures to any substance. The AAPCC indicated that a significant proportion of the reports were generated from hospital emergency departments or en-route to a medical treatment facility.

use for MAB-CHMINACA. The HHS concluded that MAB-CHMINACA has no currently accepted medical use in treatment in the United States.

c. *Individuals are taking the substance on their own initiative rather than on the basis of medical advice from a practitioner licensed by law to administer such drugs in the course of his professional practice*

According to the HHS, MAB-CHMINACA is not approved for medical use and is not formulated or available for clinical use. Therefore the human use of this substance is likely to be on an individual's own initiative, rather than on the basis of medical advice from a practitioner licensed by law to administer drugs. Further, AAPCC reports, published scientific and medical literature, and law enforcement reports indicate that individuals are taking MAB-CHMINACA on their own initiative, rather than on the basis of medical advice of a licensed practitioner.

d. The drug or drugs containing such a substance are new drugs so related in their action to a drug or drugs already listed as having a potential for abuse to make it likely that they will have the same potentiality for abuse as such substance, thus making it reasonable to assume that there may be significant diversions from legitimate channels, significant use contrary to or without medical advice, or that it has a substantial capability of creating hazards to the health of the user or to the safety of the community.

As noted by the HHS, MAB-CHMINACA, similar to schedule I SCs, display high affinity binding and potent agonist functional activity at the cannabinoid (CB1) receptor, while drug discrimination studies have demonstrated the ability of MAB-CHMINACA to substitute for THC (see factor 2).

Factor 2: Scientific Evidence of Pharmacological Effect, if Known

MAB-CHMINACA is a synthetic cannabinoid (figure 1) that has pharmacological effects similar to the schedule I hallucinogen delta-9-tetrahydrocannabinol (Δ9-THC) (Janowsky, 2014; Gatch and Forster, 2017) and other temporarily and permanently controlled schedule I SCs. In vitro receptor binding and functional assays were

conducted with MAB-CHMINACA and these data are shown in Table 1. These data indicate that MAB-CHMINACA binds to and activates CB1 receptors and thus acts as an agonist at this receptor. In addition, drug discrimination assays using Sprague Dawley rats to identify drugs with THC-like subjective effects demonstrated that MAB-CHMINACA fully substituted for the discriminative stimulus effects of THC.

Table 1. *In vitro* binding and functional and *in vivo* drug discrimination data for MAB-CHMINACA

	In vitro		***In vivo***
	Binding at CB1[3]	**Function at CB1**[4]	**Drug Discrimination**[5]
MAB-CHMINACA	0.289 nM[a] 0.49 nM[b]	0.620 nM[a] 0.214 nM[b]	Full substitution (ED_{50} = 0.07 mg/kg)[c]
[a] WO/2009/106980; [b] Janowsky, 2014; Gatch and Forster, 2017			

The drug discrimination assay is a well-accepted animal model used to predict subjective effects of substances in humans (Schuster and Johanson, 1988; Balster and Bigelow, 2003; Tai et al., 2014). In NIDA-sponsored drug discrimination studies, MAB-CHMINACA, similar to other schedule I SCs (e.g., JWH-018; AM2201; ADB-PINACA, AB-FUBINACA, AB-CHMINACA etc.), fully substituted for THC in animals trained to discriminate the stimulus effects of THC (3 mg/kg) from its vehicle control. Based on results from the receptor binding (Ki), CB1 functional assays, and drug discrimination studies, the HHS concluded that MAB-CHMINACA acts as a full psychoactive cannabinoid agonist with no antagonist activity, and that MAB-CHINACA is more potent than THC (schedule I), and is similar in activity to JWH-018, ADB-PINACA, and AB-CHMINACA (schedule I). As stated by the HHS, these data indicate that MAB-CHMINACA is more potent than the schedule I cannabinoid THC in producing

[3] In vitro CB1 receptor binding assays are conducted in membrane preparations from HEK-293 cells or CHO cells that expressed human CB1 receptors with [^{3}H]CP 55940 as a radioligand.
[4] In vitro CB1 receptor functional assays are conducted by measuring morphological responses following drug administration in CHO cells that expressed human CB1 receptors. For determination of agonist functional activity, cAMP inhibition assay was conducted using CHO cells that expressed human CB1 receptors.
[5] Discriminative stimulus effects are evaluated by the ability of test drug to substitute for the discriminative stimulus effects of THC (3 mg/kg) in rats.

behavioral pharmacological effects and shares pharmacological effects with other synthetic cannabinoids in schedule I, such as JWH-018.

Human Studies

No human studies involving MAB-CHMINACA have been reported.

Factor 3: The State of Current Scientific Knowledge Regarding MAB-CHMINACA

SCs emerged in the early 1980s. They were originally designed to investigate structure activity relationships (SAR) based on the potent substance, 9-nor-9β-hydroxyhexahydrocannabinol (HHC) (Weissman et al., 1982; Melvin et al., 1984). Interest in various structural classes was generated by the mouse vas deferens (MVD) and prostaglandin synthetase activity of pravadoline and subsequent finding of its affinity to the cannabinoid receptor (Huffman, 2009).

Chemistry and Physical Properties

Figure 1. Chemical Structure of MAB-CHMINACA

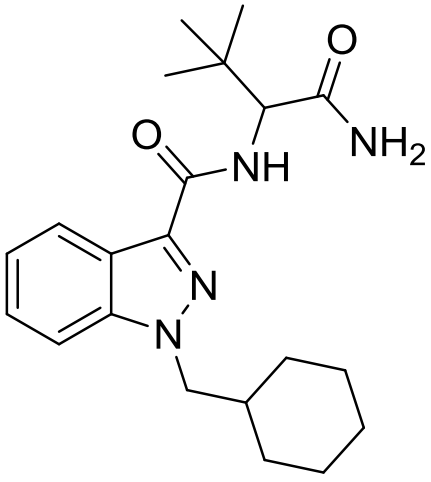

Table 2. The chemical and physical properties of *N*-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(cyclohexylmethyl)-1*H*-indazole-3-carboxamide

Synonyms	MAB-CHMINACA; ADB-CHMINACA
Systemic Name (IUPAC, CAS)	*N*-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(cyclohexylmethyl)-1*H*-indazole-3-carboxamide
CAS #	1185887-13-1
Chemical Formula	$C_{21}H_{30}N_4O_2$
Molecular Weight	370.5

N-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(cyclohexylmethyl)-1*H*-indazole-3-carboxamide (MAB-CHMINACA; ADB-CHMINACA)

MAB-CHMINACA shares structural features with a number of schedule I SCs such as, AKB48, AB-FUBINACA, ADB-PINACA, and AB-CHMINACA. AKB48, AB-FUBINACA, ADB-PINACA, AB-CHMINACA, and MAB-CHMINACA have the same indazole core structure with substitutions at the 1- and 3-positions of the indazole ring. All five substances are substituted at the 3-position with an amide. AB-CHMINACA and AB-FUBINACA are further substituted at the amide nitrogen atom with an amino-1-methyl--oxobutan-2-yl group whereas ADB-PINACA and MAB-CHMINACA are substituted with an amino-1,1-dimethyl-oxobutan-2-yl group. In AB-CHMINACA and MAB-CHMINACA, the 1-position is substituted with a cyclohexylmethyl moiety. MAB-CHMINACA was first reported in the scientific literature in a Pfizer patent (WO/2009/106980) and identified as compound 13. A study conducted by the Department of Veterans Affairs Medical Center under the interagency agreement with the DEA indicated that MAB-CHMINACA binds to the CB1 receptor and acts as an agonist at this receptor (Janowsky, 2014) (table 1), similar to results reported in the original Pfizer patent for compound 13 (WO/2009/106980).

Medical Application

The DEA is not aware of any currently accepted medical use in treatment in the United States for MAB-CHMINACA. The Administrator of the DEA sent a letter dated May 14, 2015 to the Assistant Secretary for Health of HHS notifying HHS of DEA's intent to temporarily place MAB-CHMINACA in schedule I and solicited comments,

including whether there was an exemption or approval in effect for the substances in question under the Federal Food, Drug and Cosmetic Act. On June 3, 2015, the Assistant Secretary for Health of the HHS advised the DEA that there are no approved new drug applications or investigational new drug applications for MAB-CHMINACA under section 505 (21 U.S.C. 355) of the Federal Food, Drug, and Cosmetic Act. HHS has no objection regarding the temporary placement of MAB-CHMINACA in schedule 1 of the CSA. In their scheduling recommendation, HHS stated that MAB-CHMINACA is not approved for medical use, is not formulated or available for clinical use, and that all human self-administration is assumed to be on an individual's own initiative, rather than on the basis of medical advice from a practitioner licensed by law to administer drugs.

Metabolism and Pharmacokinetics

Carlier et al. (2017) and Hasegawa et al. (2017) evaluated the metabolism of MAB-CHMIMINACA. Carlier et al. utilized a human hepatocyte assay while Hasegawa et al. extracted metabolites from the urine collected at the time of autopsy of a deceased synthetic cannabinoid user. These results are summarized in Table 3.

Table 3. Metabolism and pharmacokinetics of MAB-CHMINACA

Substance	Pathways Observed/ Common Metabolite Observed	# of Metabolites Observed	Assay Conditions	Citation
CELL ASSAYS				
MAB-CHMINACA	Cyclohexylmethyl hydroxylation and further ketolization; tert-Butyl hydroxylation; and dihydroxylation	10	Cryopreserved human hepatocytes	Carlier et al., 2017
BIOLOGICAL SAMPLES				
MAB-CHMINACA	Hydroxylated at 4-cyclohexylmethyl and tertbutyl metabolism	2	Human urine specimen via autopsy	Hasegawa et al., 2017

Factor 4: Its History and Current Pattern of Abuse

As noted by the HHS, SCs have been developed over the last 30 years as tools for investigating the cannabinoid system (Weissman et al., 1982; Huffman et al., 1996; Huffman et al., 1999). The first encounters of SCs within the United States occurred in November 2008 by CBP. Since then the popularity of SCs and their associated products has increased steadily as evidenced by law enforcement seizures, public health information, and media reports. Despite the placement of numerous SCs found on the illicit market in schedule I of the CSA, new versions of SCs intended to circumvent current controls continue to be encountered. MAB-CHMINACA is a SC that was associated with the hospitalization of 125 individuals around Baton Rouge, Louisiana in October, 2014 (*see* factor 6). Since that time, multiple overdoses and deaths involving MAB-CHMINACA have been reported in Texas (in Bryan and Beaumont), Kansas (in Salina), Mississippi (in Philadelphia and Jackson), Virginia (in Hampton), and in Maryland (in Hagerstown) (Trecki et al., 2015; CDC, 2015) (also *see* factor 6). Specifically, in April 2015 originating in Texas, Mississippi and Alabama, the largest nationwide outbreak involving SCs was reported by multiple news outlets. State public health entities eventually reported over 2,000 overdoses and at least 33 deaths associated with abuse of SCs across at least 11 States between April and May of 2015. Of these overdoses and deaths, toxicology results have determined that a majority of overdoses from the April/May 2015 cluster were due to ingestion of MAB-CHMINACA (Trecki et al., 2015; CDC, 2015) (*see* factor 6). On April 29, 2015, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) reported multiple outbreaks of intoxications within the United States resulting from the ingestion of products believed to contain SCs. EMCDDA further reported that MAB-CHMINACA had been implicated in at least some of the cases. EMCDDA also reported two deaths involving MAB-CHMINACA, one in Hungary and the other in Japan (EMCDDA, 2015).

Research and clinical reports have demonstrated that SCs are applied onto green plant material so that the material may be smoked as users attempt to obtain a euphoric and psychoactive "high," believed to be similar to marijuana (McKeever et al., 2015; Bonar et

al., 2014). Data gathered from the published studies described earlier, supplemented by discussions on Internet discussion websites, demonstrate that these products are being abused mainly by smoking for their psychoactive properties. The adulterated products are marketed as "legal" alternatives to marijuana. In recent overdoses, MAB-CHMINACA has been shown to be laced on green plant material, similar to the SCs that have been previously available.

The psychoactive properties are directly linked to the SCs laced on the green plant material sold as retail products (Auwarter et al., 2009; EMCDDA, 2009; Atwood et al., 2010; Ogata et al., 2013). Some SC-containing products were found to be applied to known plant-based psychoactive substances, including *Cannabis sativa*, *Salvia divinorum* and *Mitragyna speciosa*. Except for the psychotropic plants named above, the plant material most commonly found as a carrier medium in SC-containing products was devoid of psychoactive effects. This demonstrates that the effects observed following ingestion of a SC product originates from the actual SC, and not the plant material (Ogata et al., 2013).

A major concern, as reiterated by public health officials and medical professionals, remains the targeting and direct marketing of SCs and SC-containing products to adolescents and youth (Auwarter et al., 2009; EMCDDA, 2009; Lindigkeit et al., 2009; Dresen et al., 2010; Hudson et al., 2010; Uchiyama et al., 2010; Uchiyama, 2012a; Uchiyama et al., 2012b; Oluwabasi et al., 2012; Durand et al., 2013; ONDCP, 2015). This is supported by law enforcement encounters and reports from emergency departments (SAMHSA, 2012, 2013, 2014; Fattore and Fratta, 2011; Vandrey et al., 2012); however, all age groups have been reported by media as abusing these substances and related products. Individuals, including minors, are purchasing SCs from Internet websites, gas stations, convenience stores, and head shops.

The Monitoring the Future (MTF) Report for 2015 reported that in 2012, for the first time, 8th and 10th graders were asked about their use of SCs, colloquially referred to as 'synthetic marijuana'; annual prevalence rates were 4.4% and 8.8%, respectively. 12^{th} graders were first asked about SCs in 2011, with an annual prevalence of 11.4%. 12^{th} grade

prevalence remained relatively constant in 2012, at 11.3%. Use in the 8th, 10th, and 12th grades dropped in 2013, and the decline was sharp and significant among 12th graders. The declines continued in 2014 and were significant for 10th and 12th graders. In 2014, the annual prevalence's for 8th, 10th, and 12th graders were 3.3%, 5.4%, and 5.8%, respectively (Johnston et al., 2015). In 2015, annual prevalence's for 8th, 10th, and 12th graders were 3.1%, 4.3%, and 5.2%. While these statistics demonstrate a decline in SC use amongst youth, hospitalizations due to serious adverse effects following ingestion of SCs, including MAB-CHMINACA, by adolescents and teens continue to occur.

Dresen and colleagues (Dresen et al., 2010) found that SCs are being abused by individuals in drug treatment centers with a positive rate of 63.3% in forensic psychiatric centers, based on their sampling. According to testimony given by the Deputy Director of the Office of National Drug Control Policy (ONDCP) to the U.S. Senate Caucus on International Narcotics Control (September 25, 2013), current drug testing misses significant populations of SC users. As described in his testimony, a study found that in a sample of men 30 years old or younger within the District of Columbia parole and probation system, 39 percent of those who passed a traditional drug screen tested positive for SCs.[6] This study further showed that between one-quarter and one-third of young men who were tested in the Washington, D.C. criminal justice system had positive test results for SCs, regardless of whether they failed or passed a traditional drug screen.[7] In addition to the psychoses, driving impairment occurred in multiple individuals with confirmed presence of a SC in their systems as reported in the scientific literature (Yeakel and Logan, 2013; Musshoff et al., 2014; Tuv et al., 2014; Jaenicke et al., 2014; Lemons, 2014; Louis et al., 2014; Karinen et al., 2015).

Smoking mixtures of SCs abused for the purpose of achieving intoxication have resulted in numerous emergency department visits and calls to poison control centers. As reported by the American Association of Poison Control Centers (AAPCC), adverse effects

[6] Office of National Drug Control Policy. *Community Drug Early Warning System: The CDEWS Pilot Project, 13.*September 13, 2013.
[7] *Id*. p. vi.

including severe agitation, anxiety, racing heartbeat, high blood pressure, nausea, vomiting, seizures, tremors, intense hallucinations, psychotic episodes, suicide, and other harmful thoughts and/or actions can occur following ingestion of SCs. Presentations at emergency departments associated with the abuse of MAB-CHMINACA have resulted in similar symptoms, including severe agitation, seizures, and/or death (*see* factor 6).

As discussed previously, it is believed most abusers of SCs or SC-related products smoked the product following application to plant material. Until recently, this was the preferred route of administration. Law enforcement has also begun to encounter new variations of SCs in liquid form. It is believed abusers have been applying the liquid to hookahs or "e-cigarettes," which allows the user to administer a vaporized liquid that can be inhaled.

Since 2009, numerous SCs have been identified as product adulterants, and law enforcement has seized bulk powder of these substances. Some initial SCs identified as being abused included JWH-018, JWH-073, JWH-200, CP-47,497, and CP-47,497 C8 homologue, followed shortly thereafter by new generations of SCs including drugs such as UR-144, XLR11, AKB48, PB-22, 5F-PB-22, AB-FUBINACA, ADB-PINACA and numerous other SCs varying only by slight modifications to their chemical structure. JWH-018, JWH-073, JWH-200, CP-47,497, and CP-47,497 C8 homologue were temporarily scheduled on March 1, 2011 (76 FR 11075), and later permanently placed in schedule I by section 1152 of the Food and Drug Administration Safety and Innovation Act (FDASIA) (Public Law 112-144) on July 9, 2012. Section 1152 of FDASIA amended the CSA by placing cannabimimetic agents and 26 specific substances (including 15 synthetic cannabinoids, 2 synthetic cathinones, and 9 synthetic phenethylamines of the 2C- series) in schedule I. UR-144, XLR11, and AKB48 were temporarily scheduled on May 16, 2013 (78 FR 28735). PB-22, 5F-PB-22, AB-FUBINACA, and ADB-PINACA were temporarily scheduled on February 10, 2014 (79 FR 7577). AB-CHMINACA, AB-PINACA and THJ-2201 were temporarily scheduled on January 30, 2015 (see table 4).

SCs and their associated products continue to be available over the Internet or found to be sold in gas stations, convenience stores, and tobacco and head shops. MAB-CHMINACA, similar to the previously scheduled SCs (78 FR 664, 78 FR 28735, 79 FR 7577, and 80 FR 5042), has been seized alone and/or laced on products that are marketed under the guise of "herbal incense" and promoted as a "legal" alternative to marijuana.

Table 4. Past control actions on SCs as Schedule I substances under the Controlled Substances Act (CSA)

Substances	Date of Temporary Control	Date of Permanent Control
JWH-018, JWH-073, JWH-200, CP-47,497, CP-47,497 C8 homologue	March 1, 2011 (76 FR 11075)	July 9, 2012 (section 1152 of FDASIA)
UR-144, XLR11, AKB48	May 16, 2013 (78 FR 28735)	May 11, 2016 (81 FR 29142)
PB-22, 5F-PB-22, AB-FUBINACA, ADB-PINACA	February 10, 2014 (79 FR 7577)	September 6, 2016 (81 FR 61130)
AB-CHMINACA, AB-PINACA, THJ-2201	January 30, 2015 (80 FR 5042)	October 16, 2017 (82 FR 47971)
MAB-CHMINACA	February 5, 2016 (81 FR 6171)	Current scheduling action

Factor 5: The Scope, Duration, and Significance of abuse

Following multiple scheduling actions seeking to safeguard the public from the adverse effects associated with SCs, law enforcement and health care professionals continue to encounter novel SCs thereby indicating the continuing abuse of these substances and their associated products. After each scheduling action of a SC, drug manufacturers and suppliers are adapting at an alarming pace to switch to new SCs to circumvent regulatory controls. Following temporary control of UR-144, XLR11, and AKB48 on May 16, 2013, there has been an increase in the availability, trafficking, and abuse of PB-22, 5F-PB-22, AB-FUBINACA, and ADB-PINACA. Following the temporary control of PB-22, 5F-PB-22, AB-FUBINACA, and ADB-PINACA on February 10, 2014, there has been an emergence of AB-CHMINACA, AB-PINACA, and THJ-2201 in the illicit drug market. Similarly, and even before temporary control of AB-CHMINACA, AB-PINACA, and THJ-2201 on January 30, 2015, MAB-CHMINACA was available on the illicit market (*see*

factor 6). From 2014 through 2016, multiple overdoses and deaths have been attributed to the abuse of MAB-CHMINACA (Trecki et al., 2015; CDC, 2015; Hasegawa et al., 2015; Adamowicz and Gieron, 2016; Katz et al., 2016).

On October 29, 2014, Louisiana issued an emergency rule adding *N*-(1-amino-3,3-dimethyl-1-oxobutan-2-yl)-1-(cyclohexylmethyl)-1*H*-indazole-3-carboxamide (MAB-CHMINACA) to the list of Schedule I Controlled Dangerous Substances upon the determination that it had a high potential for abuse and should be scheduled as a controlled substance to avoid an imminent peril to the public health, safety, and welfare.[8]

Poison control centers continue to receive calls related to the abuse of SCs and their associated products. These substances remain a threat to both the short- and long-term public health and safety. Exposures to SCs were first reported to the AAPCC in 2011 (Table 5). The most alarming report by the AAPCC was published on April 23, 2015 showing a dramatic spike in SC related exposure calls to the poison centers throughout the United States in 2015. The AAPCC reported 1,512 exposure calls related to SCs in April 2015, representing an almost three-fold increase as compared to the previous largest monthly tally (657 exposures in January 2012) since reporting began in 2011. Further, exposure calls to the AAPCC from within the first five months of 2015 (January 1 to June 1) are nearly equal to the total exposure calls involving SCs from all of 2014. Calls to the APPCC in 2015 were the highest ever recorded. In addition, a majority of exposure incidents from 2011 to the present resulted in individuals seeking medical attention at health care facilities.[9] The AAPCC continues to receive large volumes of calls regarding adverse effects following the ingestion of SCs (table 5)

[8] State of Louisiana, Department of Health and Hospitals, October 29, 2014. LAC 46:LIII.2704.A.3.

[9] The content of this report does not necessarily reflect the opinions or conclusions of the American Association of Poison Control Centers (AAPCC). AAPCC (http://www.aapcc.org) maintains the national database of information logged by the country's 57 Poison Control Centers (PCCs). Case records in this database are from self-reported calls: they reflect only information provided when the public or healthcare professionals report an actual or potential exposure to a substance (e.g. an ingestion, inhalation, topical exposure, etc.) or request information/educational materials. Exposures do not necessarily represent a poisoning or overdose. The AAPCC is not able to completely verify the accuracy of every report made to

Table 5. Exposure cases of synthetic cannabinoids as reported to poison centers*

YEAR	# OF CASES
2011	6,968
2012	5,230
2013	2,668
2014	3,682
2015	7,779
2016	2,695
2017 (Through December 31, 2017)	1,950

* AAPCC, January 2018

Chronic abuse of SCs has been linked to signs of addiction and withdrawal similar to that experienced with cannabis abuse (Zimmermann et al., 2009; Muller et al., 2010; Vardakou et al., 2010). Tolerance to these drugs may develop fairly rapidly with larger doses being required to achieve the desired effect (EMCDDA, 2009).

The following tables (tables 6 and 7) represent MAB-CHMINACA exhibits/reports as reported in the National Forensic Laboratory Information System (NFLIS[10]) and STRIDE/STARLIMS databases. Additional information can be located in appendix 1 (table 8).

member centers. Additional exposures may go unreported to PCCs and data referenced from the AAPCC should not be construed to represent the complete incidence of national exposures to any substance(s).

[10] NFLIS is a national forensic laboratory reporting system that systematically collects results from drug chemistry analyses conducted by state, local, and federal forensic laboratories in the United States.

Table 6. Reports obtained from the NFLIS database[§]

NFLIS[*] [§]				
DRUG	**2014 REPORTS[‡]**	**2015 REPORTS[‡]**	**2016* REPORTS[‡]**	**STATES**
MAB-CHMINACA	315 (September)	1,066	32	Arkansas, Arizona, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Indiana, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, North Dakota, New Jersey, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Virginia, Wisconsin

* Query date: April 5, 2016. The 2016 data are incomplete due to the normal lag time in reporting to NFLIS.
‡ The month in parenthesis (e.g., (September) corresponds to the month the substance was first encountered.
§ Laboratories reporting to NFLIS include State, local and other federal laboratories (not including DEA).

Table 7. Records obtained from DEA's STRIDE and STARLiMS databases[*§]

STRIDE and STARLiMS			
DRUG	**2014 RECORDS**	**2015 RECORDS**	**STATES[§]**
MAB-CHMINACA	3 (November)	31	Alabama, Connecticut, District of Columbia, Illinois, Indiana, Maryland, Missouri, Mississippi, New York, Puerto Rico, Tennessee, Texas, Virginia

[*] Query date: March 30, 2016
[§] Includes U.S. Territories

The abuse of SCs is evidenced in the scientific literature and by law enforcement encounters with reported adverse health effects. Numerous calls have been received by poison control centers regarding the abuse of products potentially laced with SCs that have resulted in visits to emergency departments. Even before temporary control of AB-CHMINACA, AB-PINACA and THJ-2201 in January 2015, law enforcement has once

again encountered a novel SC, MAB-CHMINACA. This chemical has been associated with severe adverse effects following its ingestion including multiple deaths.

Factor 6: What, if Any, Risk There is to the Public Health

MAB-CHMINACA was associated with a cluster of 125 subjects who presented to emergency facilities within the Baton Rouge and Shreveport, Louisiana areas in October 2014. On October 29, 2014, the Secretary of the Department of Health and Hospitals announced the addition of MAB-CHMINACA into Schedule I of the Controlled Dangerous Substances section of the Louisiana Administrative Code (LAC 46:LIII.2704.A.3). From October 2014 to the present, multiple clusters of overdoses involving MAB-CHMINACA and at least eight deaths attributed to the abuse of MAB-CHMINACA have been reported (Trecki et al., 2015; CDC, 2015; correspondence from medical examiners to DEA; Adamowicz and Gieroń, 2016; Katx et al., 2016). Details of these events are summarized below.

- In October 2014, 125 individuals in Baton Rouge, Louisiana presented at local emergency departments seeking treatment following ingestion of a SC. Crime labs from Baton Rouge and Shreveport, Louisiana identified the substance as MAB-CHMINACA.[11]
- In October 2014, four individuals in Shreveport, Louisiana presented at local emergency departments seeking treatment following ingestion of a SC. Laboratory results detected MAB-CHMINACA in biological samples from all four patients.[12]
- In October 2014, one individual in Austin, Texas was found dead following suspected ingestion of a SC. Laboratory results detected MAB-CHMINACA, AB-CHMINACA, AB-PINACA, and ADB-PINACA in biological samples.[13]

[11] Louisiana Department of Health and Hospitals (DHH), Office of Public Health, October 29, 2014.
[12] Correspondence from Dept. of Laboratory Medicine, University of California at San Francisco (UCSF) to DEA, 03/20/2015.
[13] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 03/20/2015.

- In November 2014, local media reported that over 41 individuals in Bryan, Texas presented at local emergency departments seeking treatment following ingestion of a SC; two deaths were reported within the cluster. Biological samples from 12 patients who presented at local emergency departments were received for further testing. Laboratory results detected MAB-CHMINACA in biological samples in 11 of the 12 patients and in both deceased individuals.[14]
- In December, 2014, two individuals in Salina, Kansas presented at local emergency departments seeking treatment following ingestion of a SC. Laboratory results detected MAB-CHMINACA in biological samples of both patients received.[15]
- In December 2014/January 2015, local media reported that over 62 individuals in Beaumont, Texas presented at local emergency departments seeking treatment following ingestion of a SC. Laboratory analysis of biological samples from nine of these patients detected MAB-CHMINACA in all nine patients.[16]
- In December 2014/January 2015, three individuals in Salina, Kansas presented at local emergency departments seeking treatment following ingestion of a SC. Two deaths were reported within the cluster. Laboratory results detected MAB-CHMINACA in biological samples of all three patients received.[17]
- In April 2015, local media reported that 13 individuals in Philadelphia, Mississippi presented at local emergency departments seeking treatment following ingestion of a SC. Laboratory analysis of biological samples from six of these patients detected MAB-CHMINACA in all six patients.[18]
- In April 2015, local media reported that 15 individuals in Hampton, Virginia presented at local emergency departments seeking treatment following ingestion of a SC. Within the 15 individuals, there were two deaths. Laboratory analysis of biological samples from seven of these patients detected MAB-CHMINACA in all seven patients and the two deceased individuals.[19]

[14] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 03/20/2015.
[15] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 03/16/2015.
[16] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 03/16/2015.
[17] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 03/20/2015.
[18] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 04/23/2015.
[19] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 04/23/2015.

- In April 2015, local media reported that 15 individuals in Hagerstown, Maryland presented at local emergency departments seeking treatment following ingestion of a SC. Laboratory analysis of biological samples from nine of these patients detected MAB-CHMINACA in all nine patients.[20]
- In April 2015, an individual in Sioux City, IA presented at a local emergency department following ingestion of a SC product. Despite resuscitative efforts, the individual was pronounced deceased. Laboratory results detected MAB-CHMINACA and N-methyl-2-aminoindane.[21]
- In April and May 2015, the Mississippi State Department of Health reported that over 1,011 patients from 20 different counties throughout Mississippi presented at local emergency departments seeking treatment following ingestion of a SC.[22] As of June 2, 2015, there were 1,239 reports of SC-related visits to emergency departments, hospitals or physicians in Mississippi since the outbreak began in April. In addition, 17 deaths potentially related to SC abuse were investigated.[23] Biological samples from over 350 individual patients who presented at local emergency departments were collected for analysis. Laboratory results from the first 10 patients detected MAB-CHMINACA in all of the biological samples analyzed. (CDC, 2015).[24]
- In July 2015, laboratory results following autopsy of an individual in Onondaga County, NY detected MAB-CHMINACA and AB-CHMINACA[25].
- In August 2015, an individual in Onondaga County, NY was found deceased. Laboratory results following autopsy detected MAB-CHMINACA in biological samples.[26]

Adverse health effects reported from these incidents involving MAB-CHMINACA have included: seizures, coma, severe agitation, loss of motor control, loss of consciousness,

[20] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 05/08/2015.
[21] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 10/31/2015.
[22] Mississippi State Department of Health, http://msdh.ms.gov/msdhsite/_static/resources/6255.pdf, 06/05/2014.
[23] Mississippi State Department of Health, http://msdh.ms.gov/msdhsite_static/23,0,195,682.html, 06/05/2014.
[24] Correspondence from Dept. of Laboratory Medicine, UCSF to DEA, 04/16/2015.
[25] Correspondence from Onondaga County Health Department to DEA, 12/22/2015
[26] Correspondence from Onondaga County Health Department to DEA, 12/22/2015

difficulty breathing, altered mental status, and convulsions that in some cases resulted in death. Wurita et al., (2015) and Hasegawa et al. (2015) reported the presence of MAB-CHMINACA within the body fluids and tissue samples of a recently deceased individual. Hasegawa et al. (2015) concluded that synergistic toxicity of MAB-CHMINACA and another SC, 5-fluoro-ADB, led to death.

Throughout 2013 and 2014, descriptions of overdoses, hospitalizations, severe outbreaks (CDC, 2013a,b,c) and deaths (Behonick et al., 2014) involving different SCs have been reported in both scientific publications and in the news media. Clinical effects following ingestion of SCs have been reported by physicians and emergency medical personnel (Griffiths et al., 2010; Vardakou et al., 2010). Common clinical effects relating to SC ingestion observed in emergency departments requiring medical intervention as reported by numerous State public health departments, poison control centers, and private organizations include: vomiting, anxiety, agitation, irritability, seizures, hallucinations, tachycardia, elevated blood pressure, loss of consciousness, and non-responsiveness (Forrester et al., 2011; Cohen et al., 2012; Harris and Brown, 2013; Hermanns-Clausen et al., 2013; Zawilska and Wojcieszak, 2013) (*see* reports from State health departments and poison control centers including AAPCC, appendix 1). Specifically, clinical symptoms as reported from overdoses with MAB-CHMINACA have included excited delirium, seizure, coma, agitation, myocardial infarction, convulsions, difficulty breathing, and an altered state of consciousness (correspondence from law enforcement/laboratory/clinical personnel; *see* factor 6 list of OD/Death reports). A 12-month study conducted in 2012 demonstrated that out of 950 self-reported SC-users, 2.4% reported having a medical emergency requiring treatment resulting from a combination of panic, anxiety, paranoia, and breathing difficulties (Winstock and Barratt, 2013). Data from this study also demonstrated that recent users who reported seeking emergency treatment were significantly younger than those who did not report seeking treatment (Winstock and Barratt, 2013). These data correspond to figures reported by SAMSHA, which demonstrates that youth, specifically those aged 12 to 17 years old, comprise a large percentage of users requiring emergency medical attention (SAMSHA, 2014).

Since abusers obtain these drugs through unknown sources, the identity, purity, and quantity of these substances are uncertain and inconsistent, thus posing significant adverse health risks to users. The SCs encountered on the illicit drug market have no accepted medical use in treatment in the United States. Regardless, SC products continue to be easily available and abused by diverse populations. Unknown factors including detailed product analysis and dosage variations between various packages and batches present a significant danger to an abusing individual (Auwarter et al., 2009; Hudson et al., 2010). Designer drug products have been found to vary in the amount and type of SC laced on the plant material, which could be one explanation for the numerous emergency department admissions that have been connected to these substances (Vardakou et al., 2010; Vearrier and Osterhoudt, 2010; Schneir et al., 2011; Fattore and Fratta, 2011). Similar to previous SCs, MAB-CHMINACA has been found laced on green plant material in designer drug products.

The abuse of MAB-CHMINACA, a SC with no accepted medical use in treatment in the United States, poses a serious risk to both the abuser and those connected to the abuse. HHS noted that by sharing pharmacological similarities with schedule I substances (Δ^9-THC, JWH-018 and other temporarily and permanently controlled schedule I SCs), SCs pose a risk to the abuser (Weissman et al., 1982; Compton et al., 1992; Wiley et al., 1998) and those connected to the abuse of these dangerous substances. In addition, the chronic abuse of products laced with SCs has been linked to addiction and withdrawal (Vardakou et al., 2010), with similar concerns regarding the welfare of the user as it relates to MAB-CHMINACA abuse.

7: Its psychic or physiological dependence liability

Every-Palmer (2010) has reported the recurrence of psychosis in stable individuals with a previous history of SC abuse. Every-Palmer (2011) followed-up the initial communication with interviews of 15 patients with severe mental illness in a New Zealand forensic and rehabilitation service. In a case report, dependence syndrome corresponding to the ICD-10 and DSM-IV criteria and the physical withdrawal resembled

cannabis dependence (Zimmermann et al., 2010) after the consumption of "Spice Gold." Spice Gold has been found to contain the substance JWH-018. While MAB-CHMINACA is pharmacologically related to JWH-018, no studies regarding the psychic or physiological dependence liability of MAB-CHMINACA have been identified.

8: Whether the substance is an immediate precursor of a substance already controlled

MAB-CHMINACA is not considered an immediate precursor of any controlled substance of the CSA as defined by Title 21, U.S.C § 802(23).

III. Findings for Schedule Placement Pursuant to 21 U.S.C. 812(b)

21 U.S.C. 812(b) requires the evaluation of a substance's abuse potential, currently accepted medical use in treatment in the United States, and safety for use under medical supervision for scheduling under the CSA as a controlled substance. After consideration of the above eight factors determinative of control of a substance (21 U.S.C. 811(c)), and a review of the scientific and medical evaluation and scheduling recommendation provided by the HHS, and DEA's own analysis, the DEA finds that MAB-CHMINACA, meets the following criteria for placement in schedule I of the CSA pursuant to 21 U.S.C. 812(b)(1).

1) MAB-CHMINACA has a high potential for abuse.

MAB-CHMINACA is a synthetic substance that produces cannabinoid agonist-like pharmacological effects that are similar to those produced by schedule I substances such as THC, JWH-018, AM2201, ADB-PINACA, AB-FUBINACA, AB-CHMINACA and other synthetic cannabinoids. MAB-CHMINACA, similar to other schedule I SCs, binds to and activates the CB1 receptor in vitro and substitutes for THC in drug discrimination tests. The pharmacological similarity of MAB-CHMINACA to THC makes it reasonable to assume that its potential for abuse is high and would be similar to that of JWH-018, AM2201, ADB-PINACA, AB-FUBINACA and AB-CHMINACA which are controlled in schedule I of the CSA. NFLIS details over 1,400 reports from forensic laboratories identifying MAB-CHMINACA for a period from September 2014 through March 2016. As reported by the American Association of Poison Control Centers (AAPCC), adverse effects including severe agitation, anxiety, racing heartbeat, high blood pressure, nausea, vomiting, seizures, tremors, intense hallucinations, psychotic episodes, suicide, and other harmful thoughts and/or actions can occur following ingestion of SCs. Presentations at emergency departments directly linked to the abuse of MAB-CHMINACA have resulted in similar symptoms, including severe agitation, seizures, and/or death.

2) MAB-CHMINACA has no currently accepted medical use in treatment in the United States.

According to the HHS, there are no approved NDAs for MAB-CHMINACA in the United States. There are no known medical uses for MAB-CHMINACA. Therefore, MAB-CHMINACA has no currently accepted medical use in the United States.

3) There is a lack of accepted safety for use of MAB-CHMINACA under medical supervision.

Because MAB-CHMINACA has no approved medical use and has not been thoroughly investigated as a new drug, its safety for use under medical supervision is not determined. Thus, there is a lack of accepted safety for use of this substance under medical supervision.

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Appendix 1

Public Health

1. Monitoring the Future study results for 2017 state the use of synthetic marijuana decreased in the past year (from 2015 to 2016) from 3.1% to 2.7% among 8th graders, from 4.3% to 3.3% among 10th graders, and from 5.2% to 3.5% among 12th graders.
2. Health effects from the drug can be life-threatening and can include (AAPCC, 2016):
    a. Severe agitation and anxiety.
    b. Fast, racing heartbeat and higher blood pressure.
    c. Nausea and vomiting.
    d. Muscle spasms, seizures, and tremors.
    e. Intense hallucinations and psychotic episodes.
    f. Suicidal and other harmful thoughts and/or actions.
    g. http://www.aapcc.org/alerts/synthetic-marijuana/
3. Synthetic cannabinoids, commonly known as "synthetic marijuana," "K2," or "Spice," are often sold in legal retail outlets as "herbal incense" or "potpourri." They are labeled "not for human consumption" to mask their intended purpose and avoid Food and Drug Administration (FDA) regulatory oversight of the manufacturing process. (Office of National Drug Control Policy, 2016).
4. At least 43 States have taken action to control one or more synthetic cannabinoids. (Office of National Drug Control Policy, 2016).
5. Spice users report experiences similar to those produced by marijuana—elevated mood, relaxation, and altered perception—and in some cases the effects are even stronger than those of marijuana. Some users report psychotic effects like extreme anxiety, paranoia, and hallucinations. (National Institute on Drug Abuse, 2015).
6. Spice abusers who were taken to emergency rooms reported symptoms that include: rapid heart rate, vomiting, agitation, violent behavior and suicidal thoughts. Spice abuse can also raise blood pressure and cause reduced blood supply to the heart (myocardial ischemia), and in some cases it has been associated with deaths. Regular users may experience withdrawal and addiction symptoms. (National Institute on Drug Abuse, 2015).
7. CESAR FAX, a publication from the Center for Substance Abuse Research at the University of Maryland (College Park), reported the results from Bonar et al. (2014) describing the results of the study of patients in a Midwestern residential treatment program. Results demonstrated that 71% of those reporting abuse of a SC used a SC-laced product to avoid a positive drug test. The two most common reasons for SC use were "curiosity" (91%) and "to feel good or get high" (89%) (September, 2014).

Table 8. NFLIS – State and Local and other Federal (not DEA) Forensic Laboratory Reports (Query date: April 5, 2016)

	2010				2011				2012				2013				2014			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
JWH-018; JWH-073; JWH-200; CP-47,497 CP-47,497 C8 homologue	138	413	670	1,197	1,515	994	659	536	427	342	234	150	110	97	84	57	70	34	22	11
UR-144; XLR11; AKB48	1*	0	0	0	0	0	0	50	548	3,369	6,332	5,285	6,741	6,669	4,055	2,950	3,722	3,311	2,761	1,991
PB-22; 5F-PB-22; AB-FUBINACA; ADB-PINACA	0	0	0	0	0	0	0	0	0	0	1	0	354	1,018	2145	2,456	3,267	2,812	1,992	1,175
AB-CHMINACA; AB-PINACA, THJ-2201	0	0	0	0	0	0	0	0	0	0	0	0	0	41	401	523	1,156	1,866	2,590	2,670
MAB-CHMINACA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	263

	2015				2016	TOTAL
	Q1	Q2	Q3	Q4‡	Q1‡	
JWH-018; JWH-073; JWH-200; CP-47,497 CP-47,497 C8 homologue	30	17	13	10	0	7,830
UR-144; XLR11; AKB48	1,951	2,034	1,648	886	140	54,443
PB-22; 5F-PB-22; AB-FUBINACA; ADB-PINACA	860	928	515	302	70	17,895
AB-CHMINACA; AB-PINACA, THJ-2201	2,793	2,530	2,304	1,079	146	18,099
MAB-CHMINACA	194	313	317	242	32	1,413

*Encounter confirmed, March 2012; ‡ = data are incomplete for December 2015 through March 2016, normal lag time for labs reporting to NFLIS

Corresponds to the date substances were placed under temporary control